

ORIGINAL RESEARCH

Prevalence of Risk Factors of Non Communicable Diseases among Undergraduate Medical Students: A Cross-Sectional Study from Rural Tamilnadu

Mariavinifa X¹, Sindhubala B², Karthikeyan S³, Vairavasolai P^{4*}

¹Assistant Professor, Department of Community Medicine, Government Medical College, Pudukottai, India.

²Assistant Professor, Department of Community Medicine, KAPV Government Medical College, Trichy, India.

³Assistant Professor, Department of Community Medicine, Government Medical College, Pudukottai, India.

^{*4}Assistant Professor, Department of Community Medicine, Government Medical College, Pudukottai, India.

Corresponding Author: Dr. Vairavasolai P, Assistant Professor, Department of Community Medicine, Government Medical College, Pudukottai, India.

ABSTRACT

Background: Non-communicable diseases has become a leading global health challenge representing the largest cause of mortality in adults worldwide. Most of the NCD risk factors are behaviorally acquired which are due to change in lifestyle during the age group between 18 to 30 years. Thus the study is undertaken to assess the risk factors of undergraduate medical students.

Methods: This study was a cross-sectional institution based observational study conducted in Department of Community Medicine, Government medical college, Pudukottai. The study included 286 undergraduate Medical students.

Results: In the present study, Out of 286 study participants, 52.1% were male and 47.9% were females. 55.6% students were not involved in any type of physical exercise and 25.2% students did physical exercise for less than 150 minutes per week. 22.3% students had increased body mass index. Family history of hypertension, diabetes and coronary heart diseases was present in 21.3% 32.1% and 24.5% of the study participants respectively. The prevalence of smoking and alcohol was 14.7% and 12.2% respectively. Consumption of junk foods was observed among 28.7% of the study participants.

Conclusion: The present study revealed that the behavioral risk factors of NCDs were high among medical students. Thus the early intervention is required to change the behavioral risk factors for prevention of NCD in the future.

Keywords: Non-communicable diseases, Risk factors, Lifestyle, Anthropometry

INTRODUCTION

Non-communicable diseases (NCDs) account for 41 million annual deaths worldwide, or 74% of all fatalities. 17 million individuals die from NCDs before they become 70 years old every year; low- and middle-income nations account for 86% of these premature fatalities. 77% of NCD-related deaths occur in low- and middle-income nations. The majority of NCD deaths (17.9 million annually) are caused by cardiovascular illnesses, which are followed in death by cancer (9.3

million), chronic respiratory diseases (4.1 million), and diabetes (2.0 million including deaths from renal disease induced by diabetes). More than 80% of all early NCD fatalities are caused by these four categories of diseases.^{1,2}

The Indian Council of Medical Research (ICMR) in 2017 estimated that the percentage of deaths in India attributable to non-communicable diseases (NCDs) increased from 37.9% in 1990 to 61.8% in 2016.³

These are slow-moving chronic illnesses brought on by a confluence of behavioral, physiological, environmental, and hereditary variables. Early on in their development, these disorders don't exhibit any symptoms. Chronic disease onset is favored by the fast changing lives and behavioral patterns of people. In affluent and emerging nations alike, the frequency of chronic non-communicable diseases is rising among adult patients.

The main risk factors for NCDs are well known and exposure to modifiable risk factors begins at a younger age. Screening medical college students is necessary as these are the population likely to achieve the role of future medical experts.⁵ Hence the present study is unquestionably justified. Research from all around the world, including India, has suggested that between 20 and 40 percent of students in a variety of fields, including medicine, suffer from substance misuse. However, most of these studies only look at alcohol or tobacco use, and a gender bias has been observed in many studies.⁶⁻¹⁰

MATERIALS & METHOD

This institution based cross-sectional study was conducted in Department of Community Medicine, Government medical college, Pudukottai. The study was undertaken for a period of one month among MBBS students (2021 and 2022 batch). The college has an annual intake of 150 undergraduate medical students. The study included 286 medical undergraduates. Ethical committee approval was obtained from the Institutional Ethical Committee, Government medical college, Pudukottai. The purpose and confidentiality of the study were explained to the students before administering the questionnaire. All consenting participants were included in the study. In the present study, a Pre-designed, Pre-tested, semi-structured questionnaire adapted from WHO Steps approach was used for data collection. Anthropometric measurements were recorded. Body mass index (BMI) was calculated from height and weight measurements. After obtaining informed consent, the questionnaire was administered and anthropometric measurements were recorded. Standard bathroom scale was used to measure the weight. Stadiometer was used to measure the height, measuring tape was used to measure waist and hip circumference of the study participants. Sphygmomanometer was used to record the blood pressure in the present study. All the instruments used in the present study were calibrated prior to data collection. The World Health Organization South Asia Pacific guidelines was used to classify the study participants based on the anthropometric measurements.¹¹ Joint National Committee 8 (JNC8) classification was used to classify the patients based on the recorded blood pressure.¹² The data were entered and analyzed using Microsoft excel. Descriptive statistics were expressed in frequency and percentages. Microsoft Excel was used to generate graphs.

Operational definition

Current tobacco user: used tobacco either daily or occasionally

Current alcohol user: consumed 30 ml or more of any form of alcohol in the year

Fruits and vegetables: Consumption of at least 400 grams of vegetables and fruits per day was considered as adequate.

Adequate physical activity: Physical activity of moderate intensity at least 30 minutes per day was considered as adequate.

RESULTS

In this study, 286 responses were collected regarding the prevalence of risk factors of non-communicable diseases. The age group of the study participants ranged between 18 to 24 years, with majority aged between 18 to 20 years. In the present study, 169 (59.1%) of them were male students, and remaining 117 (40.1%), were female students. Majority of the study participants (67.2%) of the study population were from urban residence and majority of them belonged to a nuclear family. Most of the study participants or medical students belong to class one social economic status Majority of the participants belonged to upper socioeconomic class as per modified BG Prasad scale.¹³

In the present study, we observed the family history of co-morbidities namely hypertension, type 2 Diabetes mellitus and coronary artery disease among the parents of the study participants. We noted that majority of the parents (32.1%) had the type 2 Diabetes mellitus, while coronary artery disease and hypertension were present in 24.5% and 21.3% of the family members of the study participants. Majority (55.6%) of the study participants reported no physical exercise, while 25.2% of the study participants had physical activity for at least less than 150 minutes per week. We also noted that 19.2% of the study participants had more than or equal to 150 minutes of physical activity per week. Details regarding alcohol usage was recorded we observed that 87.8% of the study participants did not report any alcohol usage, while 85.3% of the study participants did not reveal any smoking history. Among the study participants, the diet was predominantly non-vegetarian (89.2%). Information regarding vegetable intake show that 70.3% of the study participants had more than or equal to 2 servings per day of vegetables, while fruit intake was no or less than two servings per day among 82.5% of the study participants. We also found that junk food consumption was less than or equal to 3 times per week among 71.3% of the study participants.

The anthropometric measurements of the study participants was measured in the present study. We observed that the Body Mass Index data of the male participants showed that 6% were underweight, 67.9% have an acceptable body mass index while 20.8% had mild to moderate risk and 5.3% were at a higher risk. The body mass index of the female participants showed that 10.2% of the study participants where underweight, 70.5% had normal body mass index while 14.6% were overweight while 3.7% obese. The waist circumference was observed to be normal among 87.9% of the male population and 71.5% of the female population. The waist-hip ratio was found to be normal in 90.6% of the males and 73.7% of the females. The blood pressure measurements of the study participants was done, we observed that 84.6% of the male participants had a normal blood pressure while 88.3% of the female participants had normal blood pressure. Pre-hypertension was observed in 12.1% of the male population and 11.7% of the female population. We observed elevated blood pressure among 3.3% male study participants while no female participant had an elevated blood pressure.

Table 1 Socio-Demographic characteristics of the study participants (n=286)

	Frequency (n=286)	Percentage
Age		
18- 20 years	248	86.7
> 20 years	38	13.3
Gender		
Male	149	52.1

Female	137	47.9
Residence		
Rural	92	32.1
Urban	194	67.2
Family type		
Nuclear	201	70.3
Joint	85	29.7
Socio-economic status		
Class I	224	78.3
Class II	36	12.6
Class III	26	9.1

Table 2: Distribution of NCD related risk factors among study participants (n=286)

	Frequency (n=286)	Percentage
Family History of Co-morbidities		
Hypertension	61	21.3
Type 2 Diabetes Mellitus	95	32.1
Coronary Artery Disease	70	24.5
Physical exercise		
No exercise	159	55.6
<150 mins/week	72	25.2
≥150 mins/week	55	19.2
Alcohol user		
No	251	87.8
Yes	35	12.2
Smoker		
No	244	85.3
Yes	42	14.7
Diet		
Vegetarian	31	10.8
Non-vegetarian	255	89.2
Vegetables intake		
≥ 2 servings/day	201	70.3
No or <2 servings/day	85	29.7
Fruits intake		
≥ 2 servings/day	50	17.6
No or < 2 servings/day	236	82.5
Junk food		
≤ 3 times/week	204	71.3
>3 times/week	82	28.7

Table 3: Anthropometric, blood pressure distribution among the study participants (n=286)

	Male (n=149) n (%)	Female (n=137) n (%)
Body mass index (kg/m²)		
Underweight (<18.5)	9 (6)	14 (10.2)
Acceptable (18.5-23)	101 (67.9)	98 (70.5)
Mild-moderate risk (23.1-27.5)	31 (20.8)	20 (14.6)
Higher high risk (≥27.6)	8 (5.3)	5 (3.7)
Waist circumference		
Normal	131 (87.9)	98 (71.5)
Abnormal	18 (12.1)	39 (28.5)
Waist: hip ratio		
Normal	135 (90.6)	101 (73.7)
Abnormal	14 (9.4)	36 (26.3)
Blood pressure		
Normal	126 (84.6)	121 (88.3)
Pre hypertension	18 (12.1)	16 (11.7)
Increased	5 (3.3)	0 (0.0)

DISCUSSION

The present study was undertaken among the undergraduate medical students undergoing MBBS course at Government medical college, Pudukottai. The study aimed to assess the presence of non-communicable disease (NCD) risk factors among the study participants. Risk factors like duration of physical activity, type of diet, duration of exercise, and substance abuse (smoking and alcohol) were observed and recorded. We also obtained family history of existing non-communicable diseases among the family members of the study participants. We recorded the blood pressure of all the study participants. Anthropometric measurements were used to calculate the BMI, waist-hip ratio was calculated. The observations were shared with the study participants individually, later a health education session was conducted to sensitize the participants regarding non-communicable diseases with emphasis on prevention and complications.

Ibrahim et al¹⁴ in their study have reported that males were about 52% while females represented 48% of the study population. Similar findings have been reported by Rustagi et al¹⁵, Yasmin et al⁵, an increased male predominance was also observed in our study. The age distribution of the study participants also showed a similar trend as compared to similar studies from the Indian subcontinent.^{5, 14, 15}

Ibrahim et al¹⁴ had reported 28% of the parents had hypertension and 23% had diabetes. Mahmood et al¹⁶ had reported a positive family history for hypertension (30.3%) and diabetes (41.4%). Aslam et al¹⁷ had reported that 33% of the study participants had a family history of coronary artery disease. Our results showed that 32.1% had the type 2 Diabetes mellitus, 24.5% had hypertension and 21.3% of the family members of the study participants. Our findings can also be generalized with findings from similar studies.

In the present study, the prevalence of smoking and alcohol was 14.7% and 12.2% respectively. Ibrahim et al¹⁴ and Rustagi et al¹⁵ had reported an increased prevalence of smoking and alcoholism (25%). A decreased prevalence of smoking was reported by Ismail et al¹⁸ (2.5%), Mahmood et al¹⁶ (4.5%) and Al-Asadi et al¹⁹ (3.1%). The varying patterns in the reporting of the addiction status among the socio-

cultural trends according to geographical location and the comfort level of the medical students with the investigators.

Ibrahim et al¹⁴ and Rustagi et al¹⁵ had reported that 12% of the students had the habit of taking fruits and vegetables daily, while Manna et al²⁰ had reported 29% of students had the habit of consuming fruits and vegetables daily. In our study we observed that there was a frequent consumption of vegetables (70.3%) as compared to fruits (17.6%). This can be attributed to the fact that while vegetables are provided as part of their diets in the hostel whilst the fruits have to be purchased by the students on their own expense.

The frequent consumption of junk foods was observed among 28.7% of the study participants. Ibrahim et al¹⁴ had reported that 35% of the students consumed junk foods frequently. Similar findings were also reported by Dutta et al,²¹ where the consumption of junk foods was 9% among the study participants. Ismail et al¹⁸ reported that the consumption of junk foods was higher among students in Kerala. The varying patterns in the reporting of the consumption of junk foods may be attributed to the socio-cultural trends, financial status and availability.

Studies have shown that increased physical activity can greatly reduce the incidence of non-communicable diseases and its associated morbidity.

Adequate exercise can reduce the burden of many diseases. It is estimated that 2 million deaths are caused due to inadequate physical activity.²² Ibrahim et al¹⁴ had reported 30% of the students had the habit of regular physical activity, similar results have been reported by Ismail et al.¹⁸ Shah et al²³ reported that 15.2% of the students exercised daily and 56.3% exercised weekly. In the present study we observed that 44.4% of the study participants had regular physical activity, this finding can be generalized with the other studies.

CONCLUSION

There is an increased likelihood of disease occurrence among young adults in the future if the risk factors are more prevalent at an early age. Primary prevention through risk factor reduction is more beneficial than secondary prevention. In order to effectively reduce the incidence of high risk behaviors among future medical professionals, it is imperative to strategically deliver health education and foster a supportive environment that strengthens student-based approaches.

Acknowledgement:

The authors would like to express their heartfelt gratitude to the participating students and administration for permitting us to conduct the study.

Conflict of interest: None declared

Source of funding: None.

REFERENCES

1. Prüss-Ustün A, Wolf J, Corvalán C, Bos R, Neira M. Preventing disease through healthy environments: A global assessment of the burden of disease from environmental risks. Geneva: World Health Organization; 2016 (http://www.who.int/quantifying_ehimpacts/publications/preventing-disease/en/, accessed 14 July 2017).
2. World Health Organization (WHO), author Global action plan for the prevention and control of non-communicable diseases 2013–2020. Geneva, Switzerland: WHO; 2018. https://www.who.int/nmh/events/ncd_action_plan/en/
3. Indian Council of Medical Research, Public Health Foundation of India, and Institute for Health Metrics and Evaluation. India: Health of the Nation's States —The India State-Level Disease Burden Initiative. New Delhi: ICMR, PHFI, and IHME, 2017

4. Goswami S, Dutt R, Sengupta S, Chauduri S, Ahmad S, Yadav AK. Prevalence of non communicable diseases' risk factors among medical students in South Kolkata, West Bengal. *National Journal of Community Medicine*. 2018 May 31;9(05):334-9.
5. Yasmin S, Panja TK, Baur B. A study on prevalence of risk factors of non-communicable diseases among undergraduate medical student. *Int J Community Med Public Health* 2019;6:1-5
6. Meressa K, Mossie A, Gelaw Y. Effect of substance abuse on academic achievement of health officer and medical students of Jimma University, Southwest Ethiopia. *Ethiop J Health Sci*. 2009;19:155–63.
7. Epidemiologic trends in drug abuse. Proceedings of the Community Epidemiology working Group. National Institute on Drug Abuse. [accessed on January 11, 2014]. Available from: http://www.drugabuse.gov/sites/default/files/cewgjune09vol1_web508pdf .
8. Jagnany VK, Murarka S, Haider S, Kashyap V, Jagnany AK, Singh SB, et al. Pattern of substance abuse among the undergraduate medical students in a medical college hostel. *Health Popul Perspect Issues*. 2008;31:212–9.
9. Kumari R, Nath B. Study on the use of tobacco among male medical students in Lucknow, India. *Indian J Community Med*. 2008;33:100–3.
10. Arora A, Kannan S, Gowri S, Choudhary S, Sudarasan S, Khosla PP. Substance abuse amongst the medical graduate students in a developing country. *Indian J Med Res*. 2016 Jan;143(1):101-3. doi: 10.4103/0971-5916.178617. PMID: 26997021; PMCID: PMC4822348.
11. WHO expert consultation. Appropriate body-mass index for Asian populations and its implications for policy and intervention strategies. *Lancet*. 2004;363:157-63.
12. Hernandez-Vila E. A review of the JNC 8 Blood Pressure Guideline. *Tex Heart Inst J*. 2015 Jun 1;42(3):226-8. doi: 10.14503/THIJ-15-5067. PMID: 26175633; PMCID: PMC4473614.
13. Pandey V, Agarwal P. Modified BG Prasad's Socioeconomic Classification-2018: The need of an update in the present scenario. *Indian J Community Health*. 2018; 30(1):82-4.
14. Ibrahim RM, Priyadarsini SGP, Nayeem RA, Somasundaram VM, Shankar R. Prevalence of risk factors for obesity, hypertension, coronary artery disease and diabetes among undergraduate medical collegestudents of Tamil Nadu. *Int J Community Med Public Health* 2017;4:3250-5.
15. Rustagi N, Taneja DK, Mishra P, Ingle GK. Cardiovascular Risk Behavior among Students of a Medical College in Delhi. *Indian J Community Med*. 2011;36(1):51–3
16. Mahmood SE, Ansari SH. Lifestyle disease risk factors among first year medical students in Bareilly. *NJIRM*. 2013;4(2):50-4.
17. Aslam F, Mahmud H, Waheed A. Cardiovascular health--behaviour of medical students in Karachi. *J Pak Med Assoc*. 2004;54(9):492-5.
18. Ismail IM, Venugopalan PP, Sarada AK, Binub K. Prevalence of non-communicable diseases risk factors among college students of Anjarakandy Integrated Campus, Kannur, Kerala, India. 2016;30(2):106-10.
19. Al-Asadi JN, Habib OS, Al-Naama LM. Cardiovascular Risk factors among College students. *Bahrain Med Bull*. 2006;28(3):1-8
20. Manna N, Chakraborty A, Dhar G. Prevalence of Risk Factors of non-Communicable Diseases Among Undergraduate Medical Students of A Tertiary Care Setting of West Bengal. *IOSR J Dental Med Sci*. 2016;15(6):14-9

21. Dutta S. An assessment of the factors affecting food choices and their corresponding association with overweight and obesity among school going children in urban Guwahati in the age group of 13-18 years. AMCHSS, MPH thesis; 2012:5-11.
22. WHO Expert Consultation. Appropriate body-mass index for Asian populations and its implications for policy and intervention strategies. Lancet.2004;363:157-63
23. Shah TA, Bhatt R J, Patel M, Patel PG. Body mass index, dietary habits and physical exercise among school going adolescent: A cross sectional study in Ahmedabad. Natl J Community Med.2013;4:314-6.